

## WHAT IS CLAIMED IS:

1. A universal shift apparatus for a swimming pool cover motor having a rotatable drive shaft and a rope attached to the end of the swimming pool cover, comprising:

(a) a reel element for collecting the rope, the reel element being mounted to freely rotate about the rotatable drive shaft;

(b) a roll-up element for collecting the swimming pool cover, the roll-up element being mounted to freely rotate about the rotatable drive shaft assembly;

(c) a gear drive assembly driven by the rotatable drive shaft, and adapted for driving the reel element in a first rotational direction as the drive shaft rotates in a first direction, and adapted for driving the roll-up element in a second rotational direction as the drive shaft rotates in a second direction; and

(d) a shift assembly associated with the gear drive assembly to selectively reverse the first rotational direction of the reel element and to selectively reverse the second rotational direction of the roll-up element.

2. The apparatus of claim 1, wherein the reel element is adapted to collect the rope and extend the swimming pool cover as the shaft moves in the first rotational direction, and the roll-up element is adapted to collect and retract the swimming pool cover as the shaft moves in the second rotational direction.

3. The apparatus of claim 1, wherein the shift assembly includes a pivot member adapted to engage the reel element and the roll-up element.

4. The apparatus of claim 3, wherein the shift assembly includes a base member on the rotatable drive shaft for mounting the pivot member to enable the pivot member to pivot with the pull of gravity.

5. The apparatus of claim 3, wherein the pivot member is adapted to pivot in one direction to engage the reel element when the rotatable drive shaft is rotated in the first direction,

and wherein the pivot member is adapted to pivot in a second direction to engage the roll-up element when the rotatable drive shaft is rotated in the second direction.

6. The apparatus of claim 5, wherein the pivot member is mounted on the base member so as to pivot at approximately 45 degrees with respect to the longitudinal axis of the rotatable drive shaft.

7. The apparatus of claim 1, wherein the shift assembly comprises a transformable member associated with the gear assembly to transform the gear assembly to drive the roll-up element as the rotatable drive shaft rotates in the first direction, and to transform the gear assembly to drive the reel element as the rotatable drive shaft rotates in the second direction.

8. The apparatus of claim 7, wherein the transformable member is adapted to be removably attached to the rotatable drive shaft, and the gear assembly is attached to the transformable member.

9. The apparatus of claim 8, wherein the transformable member is adapted to be removably attached to the rotatable drive shaft in a first position and a second position.

10. The apparatus of claim 9, wherein the second position of the transformable member on the rotatable drive shaft is disposed approximately 90 degrees from the first position.

11. The apparatus of claim 1, further comprising a torque limiter mounted on the rotatable drive shaft, the gear assembly being associated with the torque limiter.

12. The apparatus of claim 11, wherein the shift assembly is associated with the torque limiter.

13. A universal shift apparatus, comprising:  
(a) a rotatable motor shaft;

(b) a reel element for collecting the rope, the reel element being mounted to freely rotate about the drive shaft, wherein the reel element is adapted to collect the rope and extend the swimming pool cover as the shaft moves in a first rotational direction;

(c) a roll-up element for collecting the swimming pool cover, the roll-up element being mounted to freely rotate about the drive shaft assembly, wherein the roll-up element is adapted to collect and retract the swimming pool cover as the shaft moves in a second rotational direction;

(d) a gear assembly driven by the drive shaft, including a pivot member adapted to engage and drive the reel element as the drive shaft moves in a first rotational direction, and adapted to engage and drive the roll-up element as the drive shaft moves in a second rotational direction; and

(e) a shift assembly associated with the gear assembly adapted to selectively change the orientation of the pivot member to engage and drive the roll-up element as the drive shaft moves in the first rotational direction, and to engage and drive the reel element as the drive shaft moves in a second rotational direction.

14. The apparatus of claim 13, wherein the reel element includes first drive lugs thereon for engaging the pivot member as the drive shaft moves in the first rotational direction.

15. The apparatus of claim 13, wherein the roll-up element includes second drive lugs thereon for engaging the pivot member as the drive shaft moves in the second rotational direction.

16. The apparatus of claim 13, wherein the pivot member is mounted on the gear drive assembly to pivot in response to gravity.

17. The apparatus of claim 13, wherein the pivot member is mounted to pivot at approximately a 45 degree angle in a first direction relative to the longitudinal axis of the drive shaft.

18. The apparatus of claim 13, wherein the shift assembly is adapted to change the orientation of the pivot member so that the pivot member is mounted to pivot at approximately a 45 degree angle in a second direction relative to the longitudinal axis of the drive shaft.

19. The apparatus of claim 18, further comprising a torque limiter mounted on the drive shaft, the gear drive assembly being mounted on the torque limiter.

20. The apparatus of claim 18, wherein shift assembly is mounted on the torque limiter and the gear drive assembly is mounted on the shift assembly.

21. A method for adapting a reel apparatus for a swimming pool cover motor having a rotatable drive shaft and a rope attached to the end of the swimming pool cover, comprising:

- (a) collecting the rope on a reel element, the reel element being mounted to freely rotate about the rotatable drive shaft;
- (b) collecting the swimming pool cover on a roll-up element, the roll-up element being mounted to freely rotate about the rotatable drive shaft assembly;
- (c) driving the reel element in a first rotational direction as the drive shaft rotates in a first direction, and driving the roll-up element in a second rotational direction as the drive shaft rotates in a second direction; and
- (d) selectively reversing the first rotational direction of the wind-up reel element and the second rotational direction of the roll-up element.

22. The method of claim 21, wherein the rope is collected to extend the swimming pool cover as the shaft moves in the first rotational direction, and the swimming pool cover is collected as the shaft moves in the second rotational direction.

23. The method of claim 21, wherein the steps of driving the reel element or the roll-up element include pivoting a shift member to engage the reel element or the roll-up element.

24. The method of claim 23, further comprising the step of mounting the shift member to enable the shift member to pivot with the pull of gravity.

25. The method of claim 23, further comprising pivoting the shift member in a first pivoting direction to engage the reel member as the drive shaft rotates in a first rotational direction and pivoting the shift member in a second pivoting direction as the drive shaft rotates in a second rotational direction.

26. The method of claim 25, further comprising mounting the shift member on a base member so that the shift member can pivot at approximately 45 degrees with respect to the longitudinal axis of the rotatable drive shaft.

27. The method of claim 21, further comprising changing the orientation of the shift element to drive the roll-up element as the rotatable drive shaft rotates in the first direction, and to drive the reel element as the rotatable drive shaft rotates in the second direction.

28. The method of claim 27, wherein the change of orientation step comprises removably attaching the shift element on the rotatable drive shaft alternately in a first position or in a second position.

29. The method of claim 28, wherein the second position of the shift element on the rotatable drive shaft is disposed approximately 90 degrees from the first position.

30. The method of claim 21, further comprising mounting a torque limiter on the rotatable drive shaft in association with the shift element.

31. A shift apparatus for a swimming pool cover motor having a rotatable drive shaft and a rope attached to the end of the swimming pool cover, comprising:

(a) a reel element for collecting the rope, the reel element being mounted to freely rotate about the rotatable drive shaft;

(b) a roll-up element for collecting the swimming pool cover, the roll-up element being mounted to freely rotate about the rotatable drive shaft assembly;

(c) a gear assembly driven by the rotatable drive shaft, and adapted for driving the reel element in a first rotational direction as the drive shaft rotates in a first direction, and adapted for driving the roll-up element in a second rotational direction as the drive shaft rotates in a second direction; and

(d) a torque limiter element mounted on the drive shaft and connected to the gear assembly to drive the gear assembly in response to the drive shaft.

32. The shift apparatus of claim 31, wherein the torque limiter element is connected to the gear assembly to limit the amount of torque applied to the gear assembly.

33. The shift apparatus of claim 31, wherein the torque limiter element comprises a hub connected to the drive shaft, the hub being in compression by a ring clamp around the hub.

34. The shift apparatus of claim 33, further comprising a split ring between the hub and the ring clamp.

35. The shift apparatus of claim 31, wherein the gear assembly is mounted on the torque limiter element.